Application serial no. 10/673,483
Office Action dated August 25, 2005
Response dated December 22, 2005

Remarks

We thank the examiner for his efforts to date, and for the allowance of claims 4-20 and 22-23.

Claims 1-3, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawabata et al. (U.S. Pat-6400955).

The rejection is traversed as follows. Kawabata simply does not teach the invention as claimed. Without limiting the generality of the foregoing, with respect to the rejection of claim 1, the official action bases the rejection, at least in part, by stating Kawabata teaches:

(b) rotating said downlink beam by a predetermined angle (fig. 15, 20, col. 2, lines 4-18, col. 3, lines 29-52);

With respect, Kawabata discloses no such beam rotation. Instead, Kawabata proposes a method and a system to reduce interference in a TDMA system with ***fixed*** antenna directions and positions. It does not rotate the downlink beam at all, let alone at a predetermined angle. We have not found a single place in Kawabata which discusses antenna or beam rotation. All the angles discussed therein relate to the fixed angle over which an antenna sends a signal. Kawabata teaches determining which directional antenna to transmit in each timeslot, and does not teach rotating beams between timeslot transmissions. This can be seen in Figures 1 and 5 and the related discussions, as well as set out below.

The cited passage relating to figure 15, at col. 2, lines 4-18 is reproduced below for ease of reference:

> FIG. 15 is a view showing directions in a radio communication system having a *directional antenna*. In FIG. 15, the reference numerals b1 and b2 indicate base stations which use the same frequency respectively. A sector antenna having *horizontal directivity of 60 degree* is located in each of the base stations, and the antenna of the base station b1 covers sector cells (b1-a1, b1-a2, b1-a3, b1-a4, b1-a5 and b1-a6), while the base station b2 covers sector cells (b2-a1, b2-a2, b2-a3, b2-a4, b2-a5 and b2-a6). Terminal stations p1 and p2 are present in the sector cell b1-a1, a

> terminal station p3 is present in the sector cell b1-a3, and a terminal station p4 is present in the sector cell b2-a1, each of those terminal stations has a sector antenna having *horizontal directivity of 60 degree*, and communicates with the base station by using each antenna of the sector cells respectively. (Emphasis added)

Both the figure and the passage only indicate that the antenna is directional, with **a fixed angle of directivity.** This passage does not teach or suggest rotating of the beam from an antenna, let alone rotating the beam by a predetermined angle.

This passage is reinforced by the following passage from Kawabata, which shows that the beams are **not rotated, but fixed**, thus creating overlapping areas and therefore interference to a terminal station which is in the area of overlap:

> FIG. 15 shows the case where sector cells orient in the same direction at the same timing like the slot U2. Each directional area of the terminal station p4 and the base station b1 are shown by a dotted line. There are included not only the base station b2 but also the base station b1 within the directional area of the terminal station p4, and there is included the terminal station p4 within the directional area of the base station b1. **Therefore, the terminal station p4 easily receives radio waves not only from the base station b2 which is a desired base station but also from the base station b1 which is an interference station** and shows a state in which the interference becomes larger. (col 2 lines 39-50)

The cited passage describing Fig 20 is reproduced below:

> FIG. 20A and FIG. 20B show a relation between interference distance, height of an antenna, and required attenuation angle. Herein, it is assumed that a term "overreach" indicates a phenomenon in which interference waves reach a base station from a remote base station using the same frequency, and that a distance at which the overreach happens is called as "interference distance" and a *difference between the elevation angle of an antenna for which waves will be within the base station area and an elevation angle thereof with which waves will reach a base station area existing within an interference distance is called as "required attenuation angle"*. FIG. 20A shows a relation between the interference distance and the required attenuation angle

> assuming that the height of the antenna in the base station is constant. In the figure, as compared to a required attenuation angle.phi. when an interference distance is D, a required attenuation angle.phi. 'when the interference distance is longer indicated by D' may be larger, which allows design of an antenna to be easier. FIG. 20B shows a relation between the interference distance and the height of an antenna in the base station assuming that the required attenuation angle is constant. In the figure, as compared to an antenna height h when an interference distance is D, the antenna height h' when the interference distance is longer indicated by D' may be lower, which allows better mountability of an antenna. (col. 3, lines 29-52, Emphasis added).

Neither figure 20 nor this passage teaches or suggests rotating of the beam from an antenna, let alone rotating the beam by a predetermined angle. Once again this passage and the entire Kawabata reference deals with fixed antenna directions. This can be seen, for example with reference to Figure 2 and the following passage.

> FIG. 2A shows *directions of the antennas with signs (a1, a2, a3, a4, a5 and a6)*. FIG. 2B shows direction-determining patterns used for allocating each communication line with a terminal station thereto.
>
> Each of the plurality of direction-determining patterns has a correlation between a period or a timing (T1, T2, T3, T4, T5 and T6) and a direction of each antenna (a1, a2, a3, a4, a5 and a6). For example, the pattern 1 *correlates* each period or timing of T1, T2, T3, T4, T5 and T6 to *each of antenna directions a1, a2, a3, a4, a5 and a6* respectively. It should be noted that, a number of direction-determining patterns is equal to a maximum of a number of antenna directions, so that directions between different direction-determining patterns are set so that the antennas are not oriented to the same direction for the same period or at the same timing. (col 6, lines 35-49, emphasis added)

Accordingly claim 1 is not anticipated because at least element b) is simply not taught (or suggested) by the Kawabata reference.

Furthermore, the rejection states that element c) is taught in the following passages:

(c) transmitting along said downlink beam to a further user terminal during a second time slot (fig. 2-3, 16-18, col. 2, line 19 to col. 3, line 12, col. 5, line 39 to col. 7, line 23); and

However, these sections do not teach doing so for a rotated downlink beam. Indeed, as discussed above with reference to figure 2, Kawabata teaches selecting one of a set of six fixed directional antennas for a second time slot, and does not teach rotating the beam prior to the transmission of the second time slot, as required by the claim.

Accordingly, element c) is neither taught or suggested by Kawabata, for the reasons set out above with reference to element b). And element d) is certainly not taught, as Kawabata does not even teach elements b), and c), once, let alone repeating them.

Regarding the rejection to claims 2 and 3, they are both allowable for the reasons set out above. In addition, with respect to claim 2, it is submitted that Kawabata does not teach a predetermined angle for beam rotation, let alone one which is a part of the width of the downlink beam. In any event, the cited passages do not teach this. Furthermore, Kawabata does not teach performing the steps of our claim at all, let alone in a cyclic manner. The cited passages for rejecting claim 3 teach a frequency re-use pattern, which may be repeated cyclically, but this does not teach the subject matter of claim 3.

Accordingly, Kawabata does not teach or suggest claim 1-3, and withdrawal of the rejection is requested.

Regarding the rejection to claim 21, Kawabata simply does not teach the invention as claimed. Without limiting the generality of the foregoing, Kawabata does not teach or even suggest rotating a first beam at all, as discussed above, let alone along a plurality of successive orientations according to a first rotation scheme. Once again the cited passages relate to which of the fixed antennas are used to transmit on which timeslots, and do not in any way relate to beam rotation. Kawabata certainly does not teach rotating a second beam, let alone along a plurality of successive orientations according to a second rotation scheme. Accordingly, for these reasons at least, Kawabata does not anticipate claim 21, and withdrawal of the rejection is requested.

Accordingly, it is submitted that claims 1-3 and 21 are allowable, and a notice of allowance is hereby requested.

Should the examiner have any questions or desire clarifications, the examiner is invited to contact the undersigned.

The Commissioner is hereby authorized to debit $120.00 from Deposit Account No. 501593, in the name of Borden Ladner Gervais LLP, representing the fees for a one month extension of time.

The Commissioner is hereby authorized to charge any additional fees, and credit any over payments to Deposit Account No. 501593, in the name of Borden Ladner Gervais LLP.

Respectfully submitted,

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By: ______________________

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